SECTION SN
SONAR SYSTEM

CONTENTS

PRECAUTION

PRECAUTION

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000011978493

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery and wait at least three minutes before performing any service.**

Precaution for Work

INFOID:0000000011978495

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:

- Water soluble dirt:

- Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, dry cloth.

- Oily dirt:

- Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
- Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
- Then rub with a soft, dry cloth.

- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

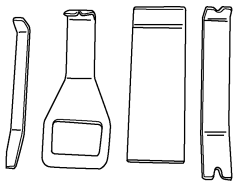
PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000011978496

The actual shape of the tools may differ from those illustrated here.

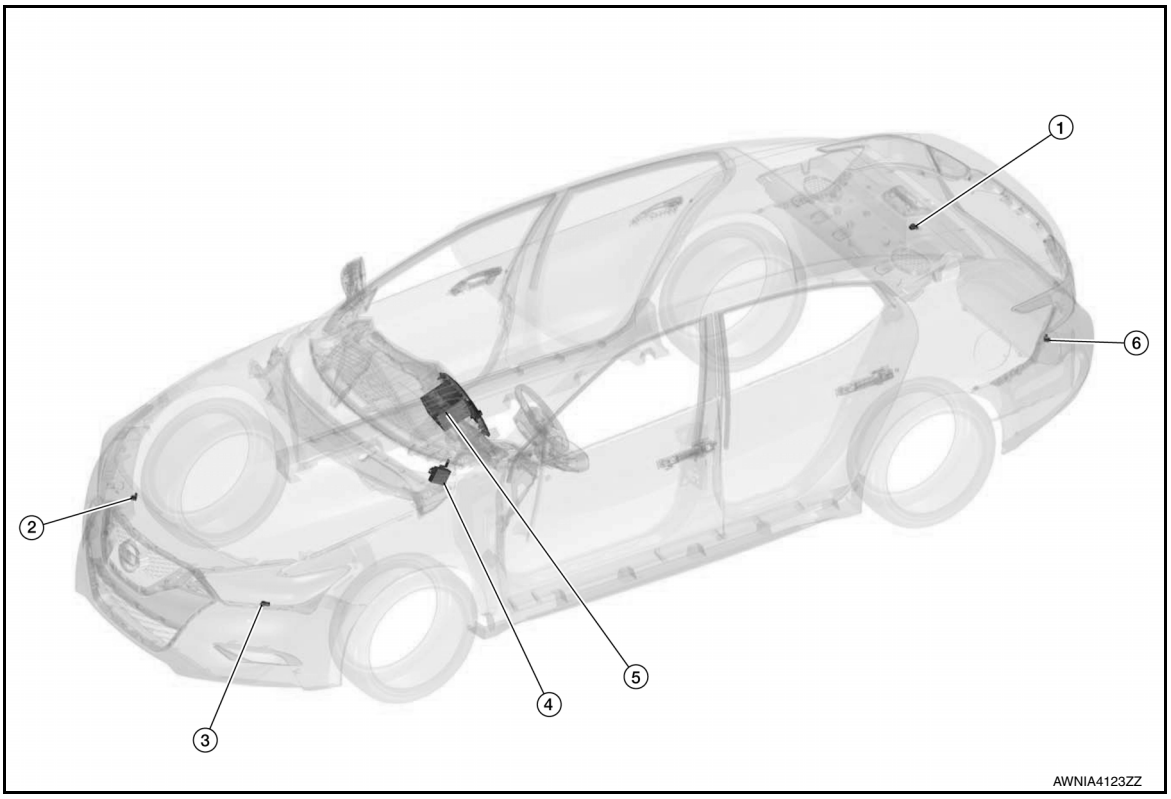
Tool number (TechMate No.) Tool name	Description
— (J-46534) Trim Tool Set  AWJIA0483ZZ	Removing trim components

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000011978497



Component Description

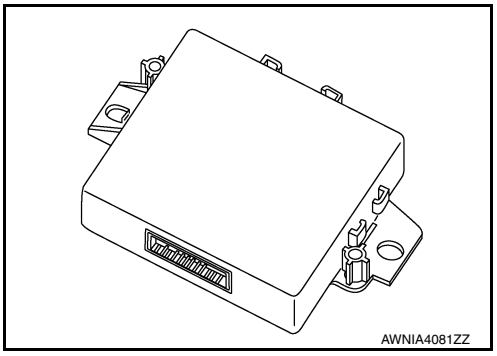
INFOID:0000000011978498

No.	Component	Function
1.	Rear sonar sensor RH outer	Senses objects in rear of vehicle
2.	Front sonar sensor RH outer	Senses objects in front of vehicle
3.	Front sonar sensor LH outer	Senses objects in front of vehicle
4.	Sonar control unit	Controls sonar system and provides self-diagnosis
5.	AV control unit	Receives buzzer signal, and transmits to speakers. Refer to AV-13, "AV Control Unit"
6.	Rear sonar sensor LH outer	Senses objects in rear of vehicle

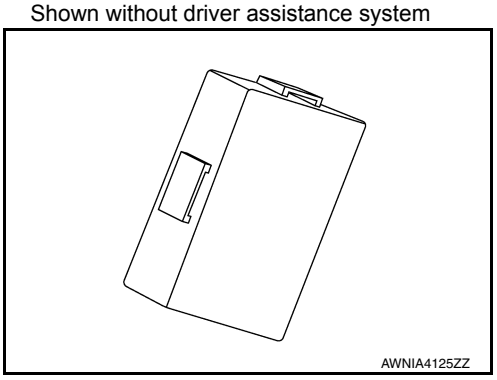
Sonar Control Unit

INFOID:0000000012282832

- The sonar control unit is installed at the lower dash.
- Necessary signals are transmitted/received to/from control unit via CAN communication.
- Sonar sensor signals received from each sensor are received in the sonar control unit and transmitted to the AV control unit.



Shown without driver assistance system

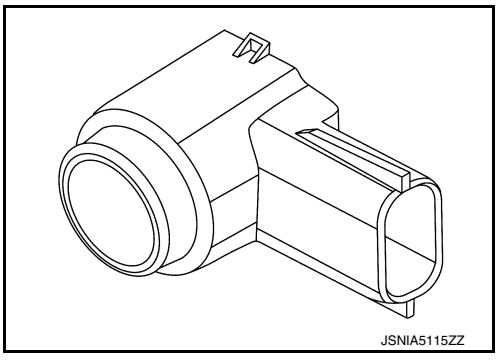


Shown with driver assistance system

Sonar Sensor

INFOID:0000000012282496

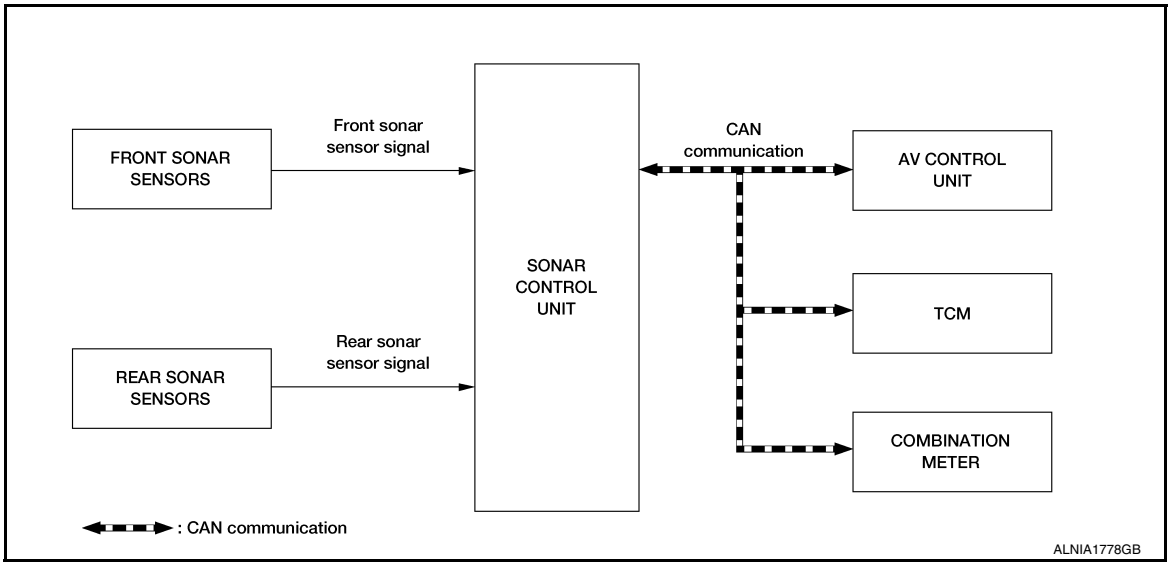
- When a distance from an obstacle is detected, a buzzer signal is transmitted to the sonar control unit.



SYSTEM

System Diagram

INFOID:0000000011978499



System Description

INFOID:0000000011978500

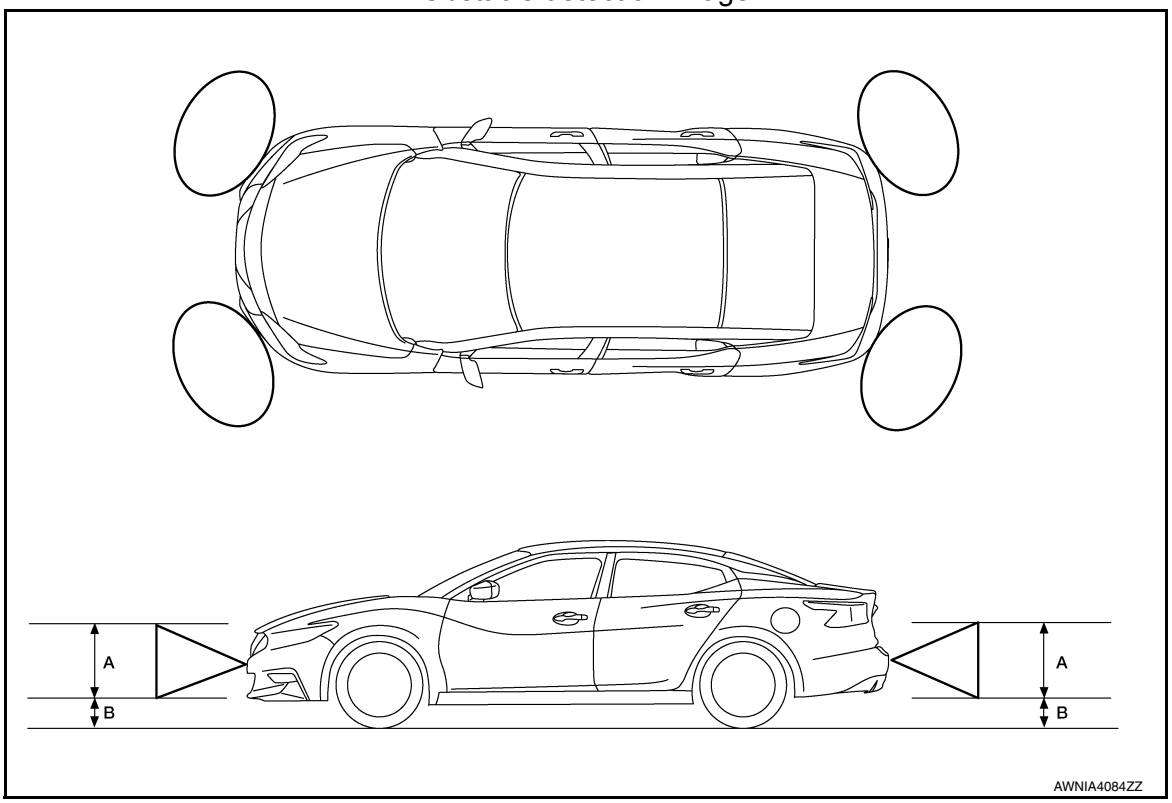
SYSTEM OPERATION DESCRIPTION

- Sonar sensors transmit a sensor signal to sonar control unit when detecting an obstacle, sonar control unit converts signal into a detection distance signal and transmits it to AV control unit via CAN communication.
- Combination meter operates sonar display in vehicle information display.
- Sonar control unit is capable of self diagnosis. It can detect sensor malfunction or sensor harness open circuits.

OBSTACLE DETECTION DISTANCE

- Sonar control unit changes output of sonar display and warning buzzers in 3 stages according to obstacle detection distance from corner sensors.
- Sonar control unit changes setting of obstacle detection distance in 4 stages.

Obstacle detection image



A. Approx. 50 cm (19.6 in) B. Approx. 15 cm (5.9 in)

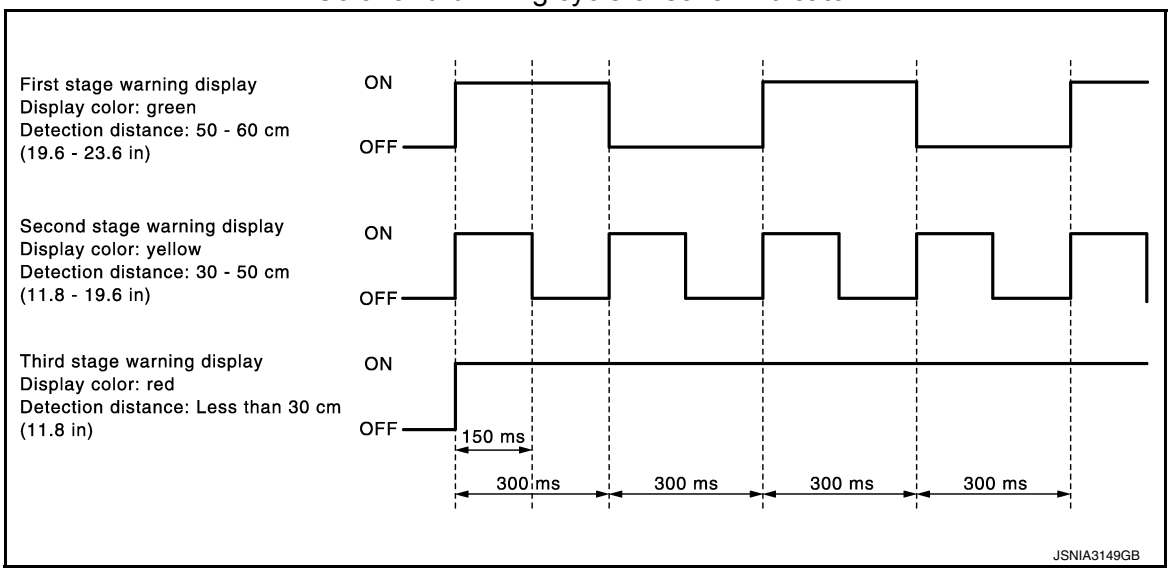
Detection distance

Warning item	Sensitivity level 1 (Fastest warning)	Sensitivity level 2 (Faster warning)	Sensitivity level 3 (Default value)	Sensitivity level 4 (Slower warning)
First stage warning	70 – 80 cm (27.5 – 31.4 in)	60 – 70 cm (23.6 – 27.5 in)	50 – 60 cm (19.6 – 23.6 in)	40 – 50 cm (15.7 – 19.6 in)
Second stage warning	50 – 70 cm (19.6 – 27.5 in)	40 – 60 cm (15.7 – 23.6 in)	30 – 50 cm (11.8 – 19.6 in)	30 – 40 cm (11.8 – 15.7 in)
Third stage warning	Less than 50 cm (19.6 in)	Less than 40 cm (15.7 in)	Less than 30 cm (11.8 in)	Less than 30 cm (11.8 in)

SONAR DISPLAY

- Combination meter receives detection distance signal via CAN communication from sonar control unit.
- Combination meter operates the sonar display in vehicle information display.
- Combination meter changes color and blinking cycle of display according to detection distance.

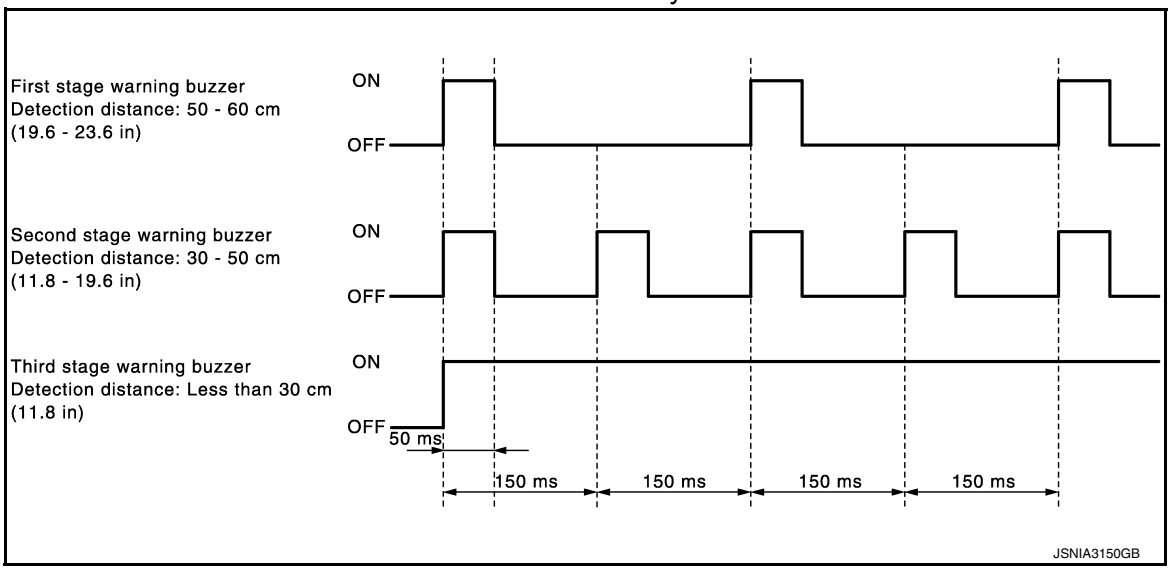
Color and blinking cycle of sonar indicator



SONAR BUZZER OPERATION

- Sonar sensors transmit a sensor signal to sonar control unit when detecting an obstacle.
- Sonar control unit converts signal received from each sensor into distance and transmits detection distance signal to combination meter via CAN communication.
- Sonar control unit transmits a buzzer signal to AV control unit.
- Sonar control unit changes buzzer cycle in 3 stages according to detection distance.

Sonar buzzer cycle



DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

CONSULT Function

INFOID:0000000011978501

CAUTION:

After disconnecting the CONSULT VI (vehicle interface) from the data link connector, the ignition must be cycled OFF → ON (for at least 5 seconds) → OFF. If this step is not performed, the BCM may not go to "sleep mode", potentially causing a discharged battery and no-start condition.

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes shown as follows:

Direct Diagnostic Mode	Description
Ecu Identification	The sonar control unit part number is displayed.
Self Diagnostic Result	The sonar control unit self diagnostic results are displayed.
Data Monitor	The sonar control unit input/output data is displayed in real time.
Active Test	The sonar control unit activates outputs to test components.
Work support	The settings for sonar control unit functions can be changed.
Configuration	• The vehicle specification can be read and saved. • The vehicle specification can be written when replacing sonar control unit.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

ECU IDENTIFICATION

Displays the part number of sonar control unit.

SELF-DIAGNOSTIC RESULTS

For details, refer to SN-16, "DTC Index".

DATA MONITOR

Monitor Item	Description
VEHICLE SPEED [mph/km/h]	Indicates vehicle speed signal received from combination meter on CAN communication line.
SONAR C/U POWER SUPPLY [V]	Indicates condition of supply voltage signal to sonar control unit.
SENSOR VOLTAGE [V]	Indicates condition of voltage signal to sonar sensors.
DETECTION MODE [Mode 1/Mode 2]	Indicates condition of display detection mode.
SONAR TEMPORARY OFF [Yes/No]	Indicates condition of sonar system.
SONAR PERMANENT OFF [Yes/No]	Indicates condition of sonar system.
P N RANGE [On/Off]	Indicates condition of CVT shift selector P (park) or N (neutral) position.
LED [Yes/No]	Indicates condition of LED indicator.
TRAILER CONNECT [CON/N CON]	Indicates if trailer is connected.
REVERSE RANGE [On/Off]	Indicates condition of transmission range switch R (reverse) position.

Monitor Item	Description
SHRT DST FRM RR SENS [cm/in]	Indicates distance to obstacle.
SHRT DST FRM FR SENS [cm/in]	
COR[RL] [cm/in]	
COR[RL]->CEN[RL]/CEN[R] [cm/in]	
CEN[RL]/CEN[R]->COR[RL] [cm/in]	
CEN[RL]/CEN[R] [cm/in]	
CEN[RL]->CEN[RR] [cm/in]	
CEN[RR]->CEN[RL] [cm/in]	
CEN[RR] [cm/in]	
CEN[RR]/CEN[R]->COR[RR] [cm/in]	
COR[RR]->CEN[RR]/CEN[R] [cm/in]	
COR[RR] [cm/in]	
COR[FL] [cm/in]	
COR[FL]->CEN[FL]/CEN[F] [cm/in]	
CEN[FL]/CEN[F]->COR[FL] [cm/in]	
CEN[FL]/CEN[F] [cm/in]	
CEN[FL]->CEN[FR] [cm/in]	
CEN[FR]->CEN[FL] [cm/in]	
CEN[FR] [cm/in]	
CEN[FR]/CEN[F]->COR[FR] [cm/in]	
COR[FR]->CEN[FR]/CEN[F] [cm/in]	
COR[FR] [cm/in]	
RVRB TIME COR[RL] [ms/sec]	
RVRB TIME COR[RR] [ms/sec]	
RVRB TIME COR[FL] [ms/sec]	
RVRB TIME COR[FR] [ms/sec]	

ACTIVE TEST

Test Item	Description
FRONT BUZZER	This test is able to check front buzzer operation [On/Off].
REAR BUZZER	This test is able to check rear buzzer operation [On/Off].

WORK SUPPORT

Support Item	Setting	Description
VOLUME SETTING	Vol.1	Allows you to set volume of warning tone.
	Low	
	Vol.3	
	Middle	
	Vol.5	
	High	
	Off	

Support Item	Setting	Description
TRAILER HITCH DETECTION RANGE ADJUSTMENT	Qu	Allows you to adjust rear sonar sensors for trailer towing.
	UP	
	DOWN	
	Qd	

CONFIGURATION

Refer to SN-25, "CONFIGURATION (SONAR CONTROL UNIT) : Description".

CAN DIAG SUPPORT MNTR

Refer to LAN-14, "CAN Diagnostic Support Monitor".

ECU DIAGNOSIS INFORMATION

SONAR CONTROL UNIT

Reference Value

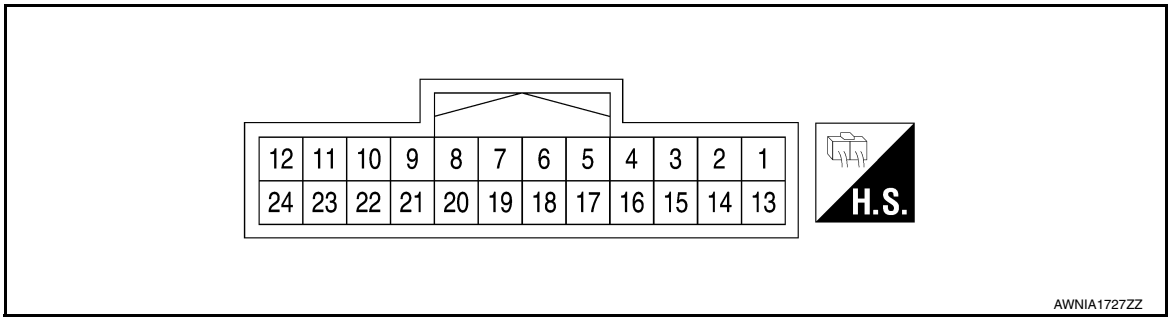
INFOID:0000000011978502

VALUES ON THE DIAGNOSIS TOOL

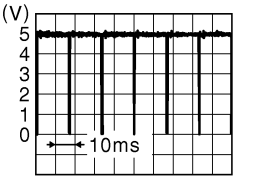
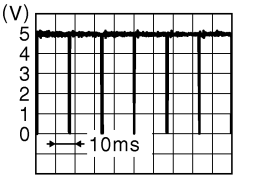
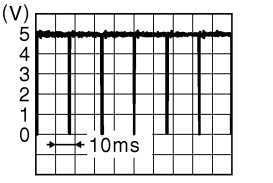
Monitor Item	Condition	Value/Status
COR[FL]	Key ON, CVT shift selector in R (reverse) position.	cm/in
COR[FR]		
COR[RL]		
COR[RR]		
COR[RL]->CEN[RL]/CEN[R] [cm/in]		
CEN[RL]/CEN[R]->COR[RL] [cm/in]		
CEN[RL]/CEN[R] [cm/in]		
CEN[RL]->CEN[RR] [cm/in]		
CEN[RR]->CEN[RL] [cm/in]		
CEN[RR] [cm/in]		
CEN[RR]/CEN[R]->COR[RR] [cm/in]		
COR[RR]->CEN[RR]/CEN[R] [cm/in]		
COR[FL]->CEN[FL]/CEN[F] [cm/in]		
CEN[FL]/CEN[F]->COR[FL] [cm/in]		
CEN[FL]/CEN[F] [cm/in]		
CEN[FL]->CEN[FR] [cm/in]		
CEN[FR]->CEN[FL] [cm/in]		
CEN[FR] [cm/in]		
CEN[FR]/CEN[F]->COR[FR] [cm/in]		
COR[FR]->CEN[FR]/CEN[F] [cm/in]		
DETECTION MODE	Key ON.	Mode 1
		Mode 2
P N RANGE	When CVT shift selector is in any position other than P (park) or N (neutral).	Off
	When CVT shift selector in P (park) or N (neutral) position.	On
LED	When LED is off.	No
	When LED is on.	Yes
TRAILER CONNECT	When no trailer is connected.	N CONN
	When trailer is connected.	CONN
REVERSE RANGE	When transmission range switch is in any position other than R (reverse).	Off
	When transmission range switch is in R (reverse) position.	On
RVRB TIME COR[FL]	Key ON, CVT shift selector in R (reverse) position.	ms/sec
RVRB TIME COR[FR]		
RVRB TIME COR[RL]		
RVRB TIME COR[RR]		
SENSOR VOLTAGE		5.0 V
SHRT DST FRM FR SENS		cm/in
SHRT DST FRM RR SENS		

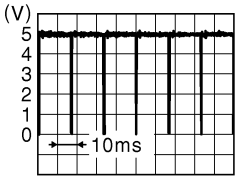
Monitor Item	Condition	Value/Status
SONAR C/U POWER SUPPLY	Key ON.	Battery voltage
SONAR PERMANENT OFF	Key ON, CVT shift selector in R (reverse) position.	No
	When selector lever is in any position other than R (reverse).	Yes
SONAR TEMPORARY OFF	Key ON, CVT shift selector in R (reverse) position.	No
	When CVT shift selector is in any position other than R (reverse).	Yes
VEHICLE SPEED	While driving, equivalent to speedometer reading	mph, km/h

TERMINAL LAYOUT- WITHOUT DRIVER ASSISTANCE SYSTEM

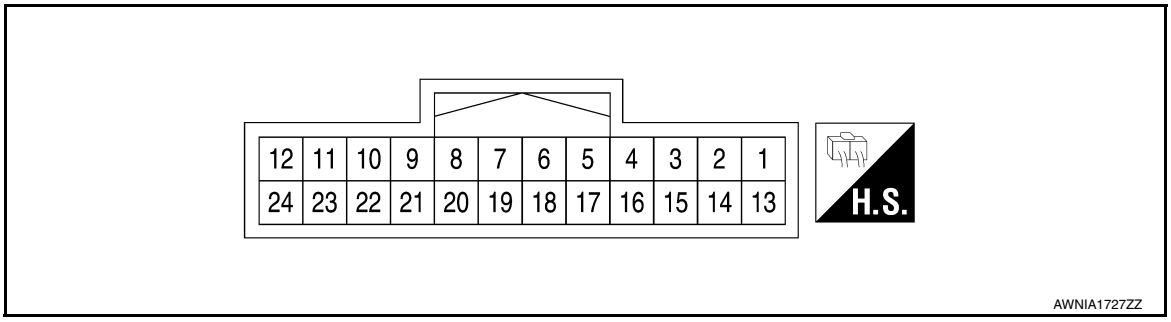


PHYSICAL VALUES

Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
3 (BG)	13 (W)	Sensor signal front LH	Input	ON	Shift position is R (reverse). Obstacle within range of front sonar sensor LH.	 JSNIA0837GB
4 (P)	13 (W)	Sensor signal front RH	Input	ON	Shift position is R (reverse). Obstacle within range of front sonar sensor RH.	 JSNIA0837GB
5 (L)	—	CAN high	Input/ Output	—	—	—
6 (P)	—	CAN low	Input/ Output	—	—	—
10 (B)	14 (W)	Sensor signal rear RH	Input	ON	Shift position is R (reverse). Obstacle within range of rear sonar sensor RH.	 JSNIA0837GB
12 (BG)	Ground	IGN power supply	Input	ON	—	Battery voltage

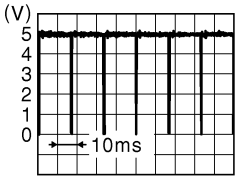
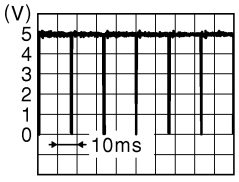
Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
13 (W)	—	Front sensor ground	—	—	—	—
14 (W)	—	Rear sensor ground	—	—	—	—
15 (B)	Ground	Ground	—	ON	—	0 V
22 (R)	14 (W)	Sensor signal rear LH	Input	ON	Shift position is R (reverse). Obstacle within range of rear sonar sensor LH.	 JSNIA0837GB

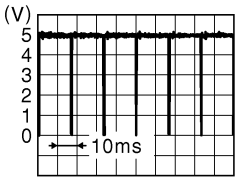
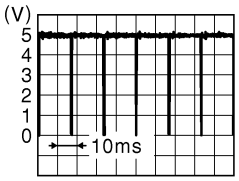
TERMINAL LAYOUT- WITH DRIVER ASSISTANCE SYSTEM



AWNIA1727ZZ

PHYSICAL VALUES

Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
1 (G)	—	Sensor ground	—	—	—	—
7 (L)	1 (G)	Sensor signal rear RH	Input	ON	Shift position is R (reverse). Obstacle within range of rear sonar sensor RH.	 JSNIA0837GB
8 (R)	1 (G)	Sensor signal rear LH	Input	ON	Shift position is R (reverse). Obstacle within range of rear sonar sensor LH.	 JSNIA0837GB

Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
9 (W)	1 (G)	Sensor signal front RH	Input	ON	Shift position is R (reverse). Obstacle within range of front sonar sensor RH.	 JSNIA0837GB
10 (B)	1 (G)	Sensor signal front LH	Input	ON	Shift position is R (reverse). Obstacle within range of front sonar sensor LH.	 JSNIA0837GB
13 (GR)	Ground	Ground	—	ON	—	0 V
17 (BR)	—	ITS CAN low	Input/ Output	—	—	—
18 (LG)	—	ITS CAN high	Input/ Output	—	—	—
24 (Y)	Ground	IGN power supply	Input	ON	—	Battery voltage

DTC Index

INFOID:0000000011978503

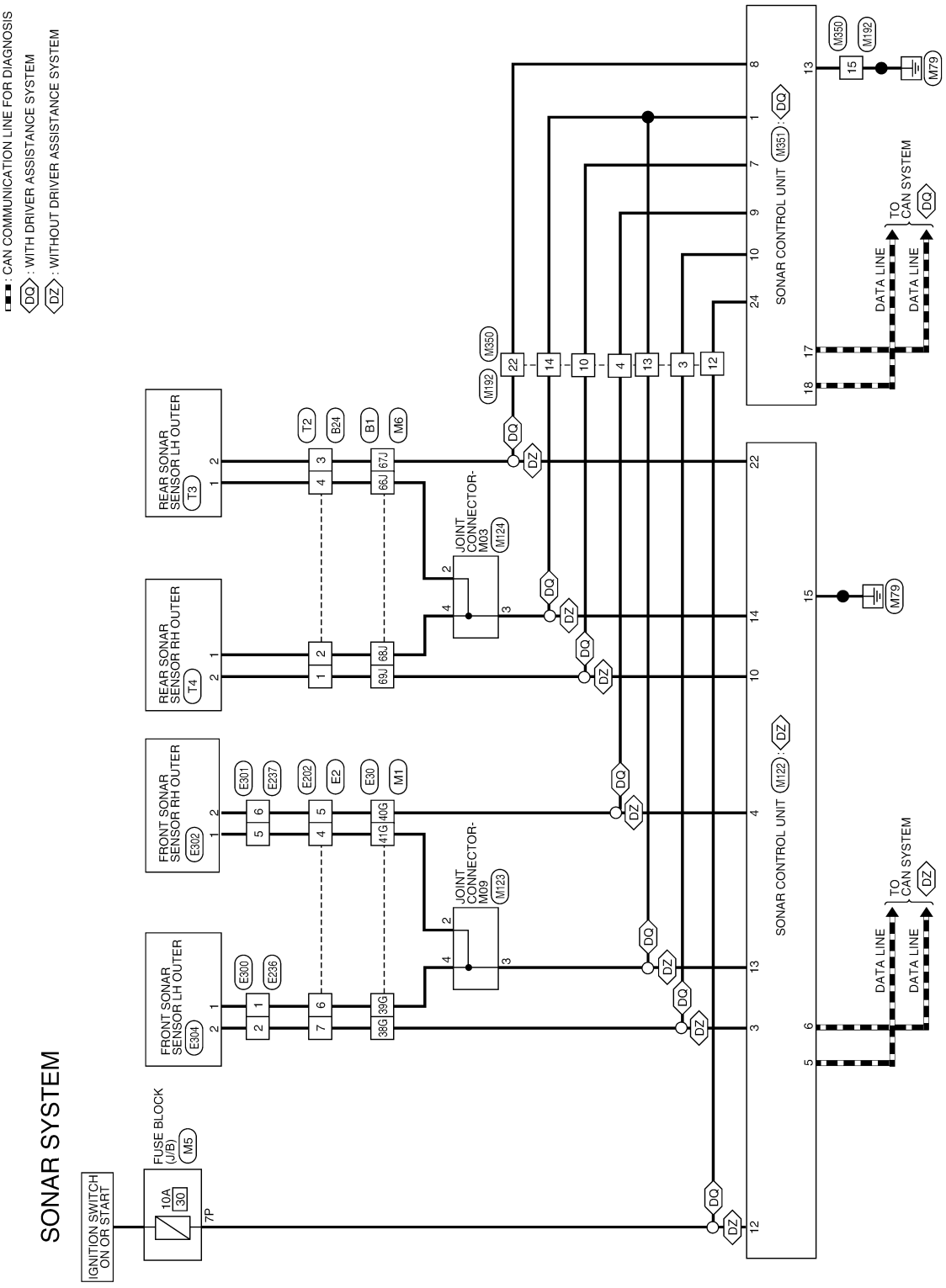
CONSULT Display	Reference Page
U1000: CAN COMM CIRCUIT	SN-27, "DTC Description"
U1010: CONTROL UNIT (CAN)	SN-28, "DTC Description"
B2720: REAR LEFT SIDE EXTERNAL SENSOR	SN-29, "DTC Logic"
B2723: REAR RIGHT SIDE EXTERNAL SENSOR	SN-31, "DTC Logic"
B2724: ECU	SN-33, "DTC Description"
B2729: FRONT LEFT SIDE EXTERNAL SENSOR	SN-34, "DTC Logic"
B272C: FRONT RIGHT SIDE EXTERNAL SENSOR	SN-36, "DTC Logic"

WIRING DIAGRAM

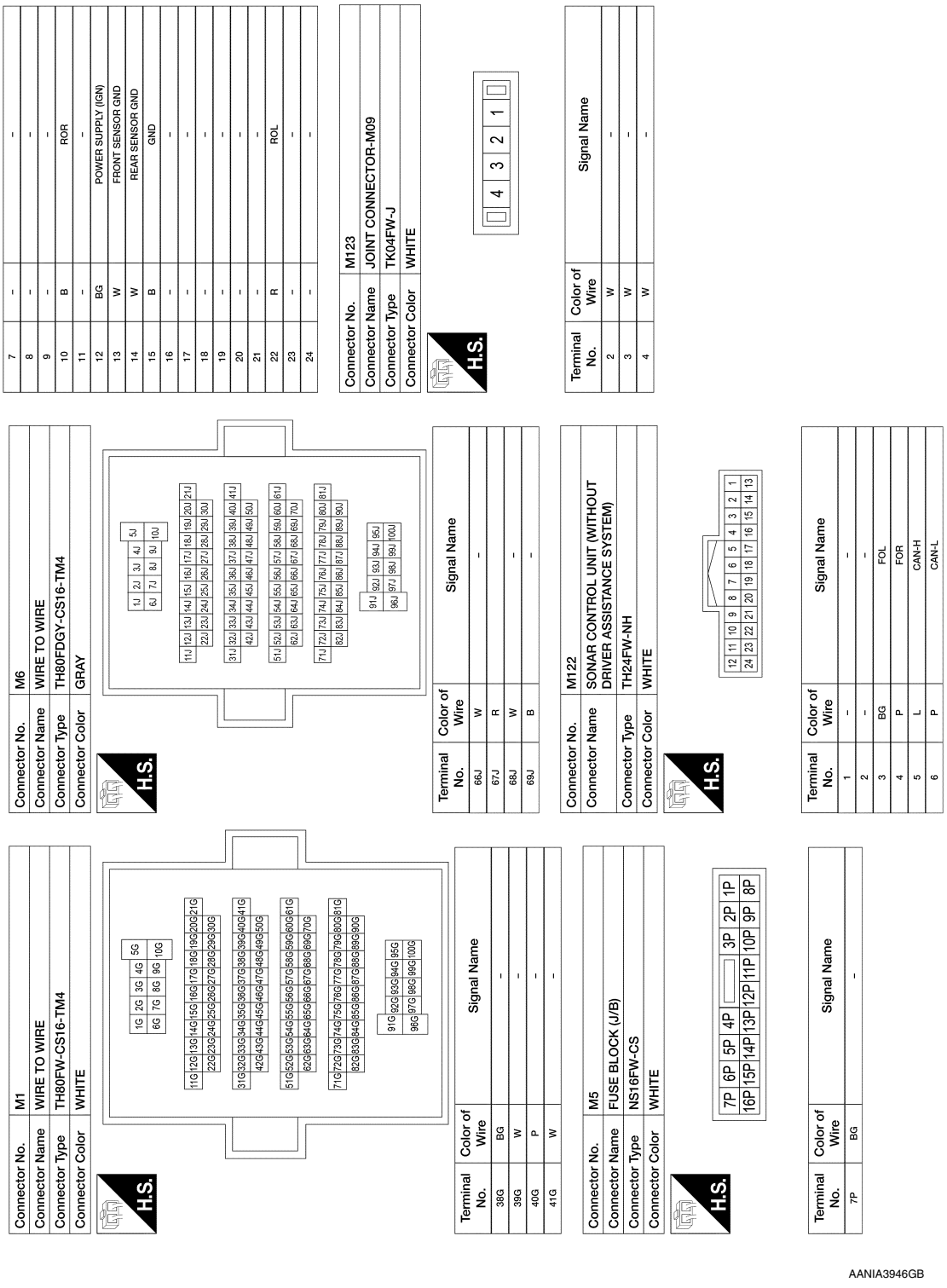
SONAR SYSTEM

Wiring Diagram

INFOID:0000000011978504



SONAR SYSTEM CONNECTORS



AANIA3946GB

Connector No.	M124
Connector Name	JOINT CONNECTOR-M03
Connector Type	TK04FW-J
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
2	W	–
3	W	–
4	W	–

Connector No.	M192
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
3	BG	–
4	P	–
10	B	–
12	BG	–
13	W	–
14	W	–
15	B	–
22	R	–

Connector No.	M350
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
3	B	–
4	W	–
10	L	–
12	Y	–
13	G	–
14	G	–
15	GR	–
22	R	–

Connector No.	M351
Connector Name	SONAR CONTROL UNIT (WITH DRIVER ASSISTANCE SYSTEM)
Connector Type	TH24FW-NH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	SENSOR GND
2	–	–
3	–	–
4	–	–
5	–	–
6	–	–
7	L	ROR
8	R	ROL
9	W	FOR
10	B	FOL
11	–	–
12	–	–
13	GR	GND
14	–	–

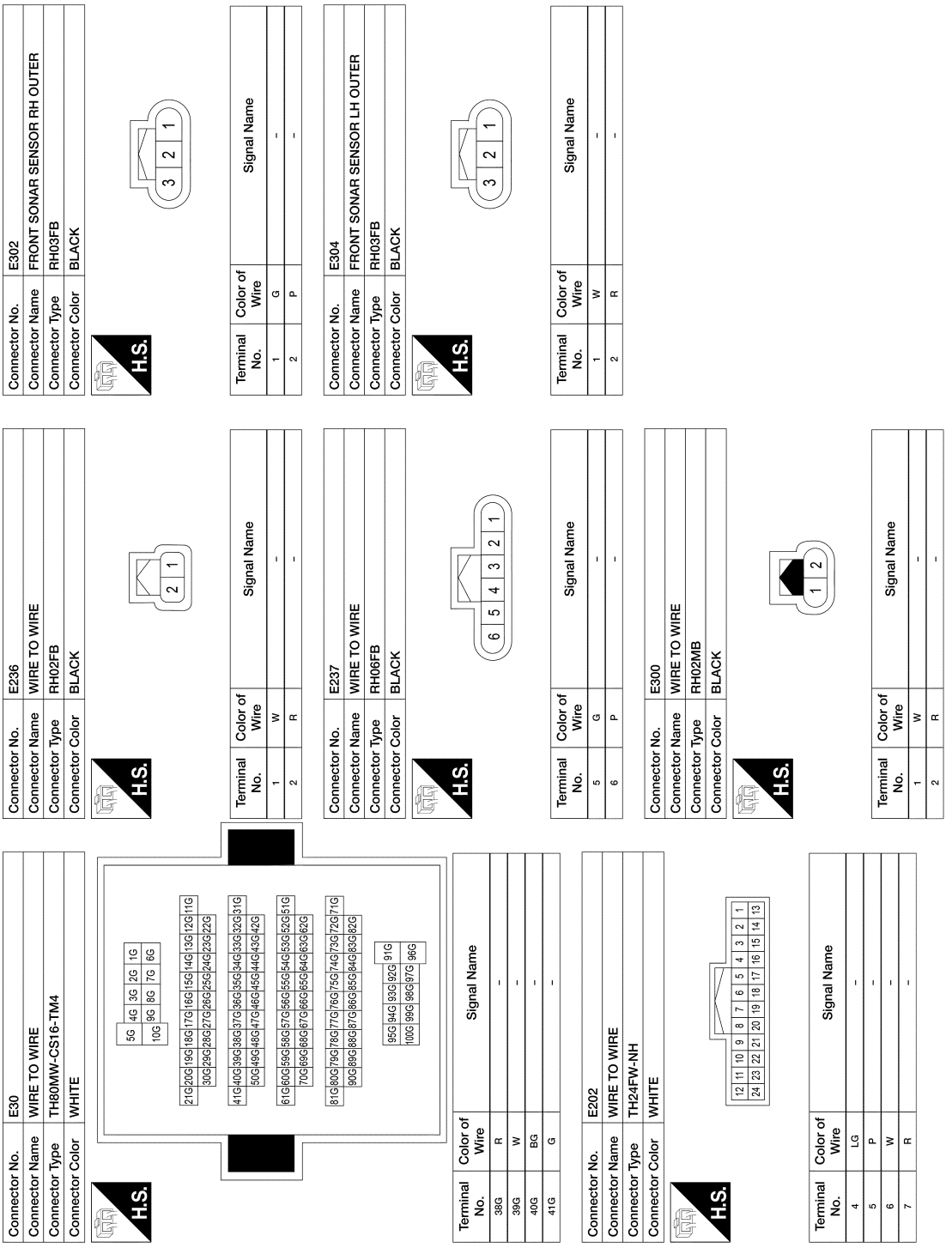
15	–	–
16	–	–
17	BR	ITS CAN-L
18	LG	ITS CAN-H
19	–	–
20	–	–
21	–	–
22	–	–
23	–	–
24	Y	POWER SUPPLY (IGN)

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE

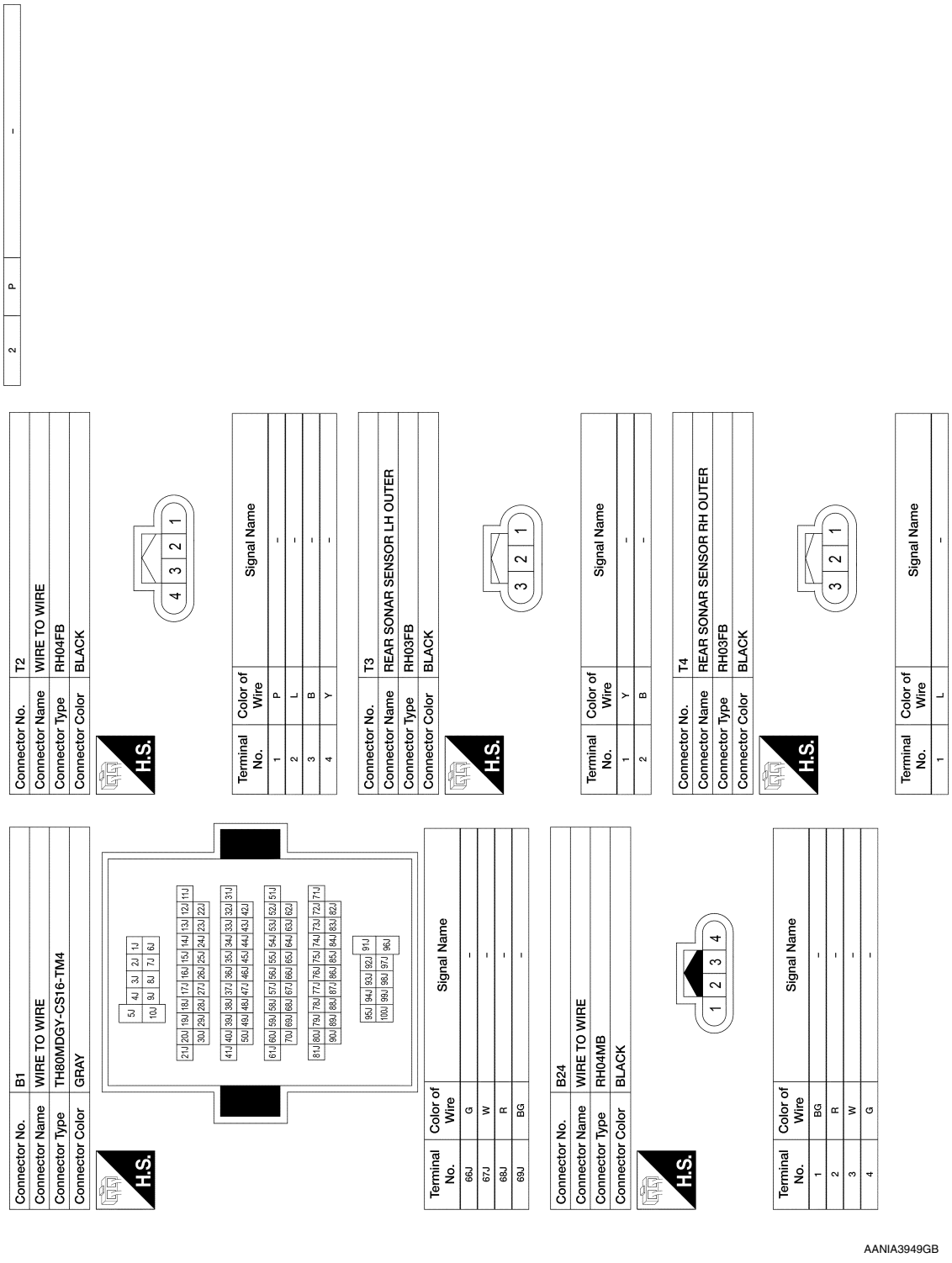
H.S.

Terminal No.	Color of Wire	Signal Name
4	R	–
5	BG	–
6	W	–
7	R	–

AANIA3947GB



AANIA3948GB



AANIA3949GB

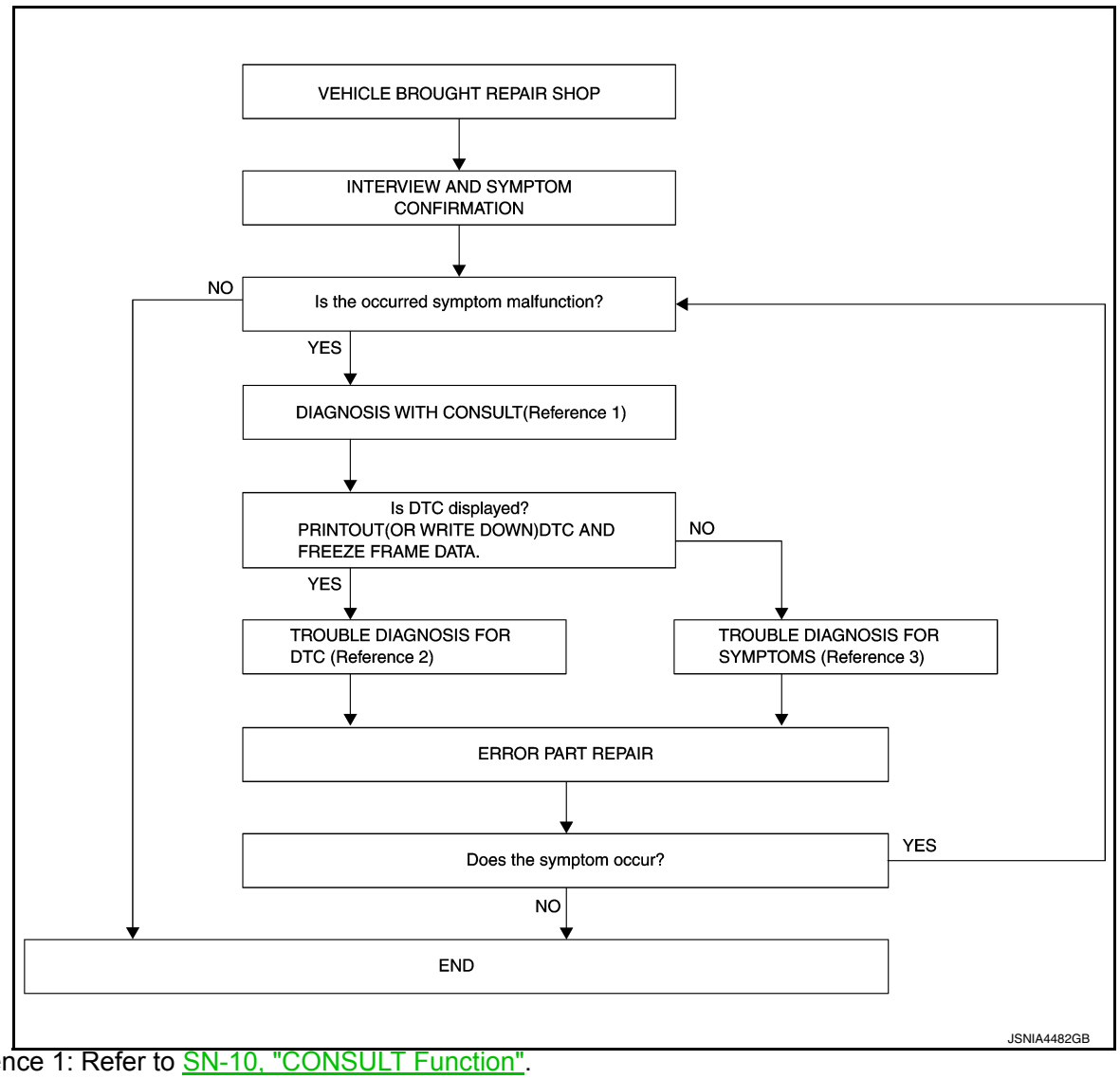
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000011978505

OVERALL SEQUENCE



Reference 1: Refer to SN-10, "CONSULT Function".
Reference 2: Refer to SN-16, "DTC Index".
Reference 3: Refer to SN-39, "Symptom Table".

DETAILED FLOW

1.INTERVIEW AND SYMPTOM CONFIRMATION

Check the malfunction symptoms by performing the following items.
- Interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred).
- Check the symptom.

Is the occurred symptom malfunction?

YES >> GO TO 2.
NO >> Inspection End.

2.DIAGNOSIS WITH CONSULT

1. Connect CONSULT and perform Self Diagnostic Result for SONAR. Refer to SN-10, "CONSULT Function".

NOTE:
Skip to step 4 of the diagnosis procedure if SONAR is not displayed.

2. When DTC is detected, follow the instructions below:

- Record DTC and Freeze Frame Data.

Is DTC displayed?

YES >> GO TO 3.
NO >> GO TO 4.

3. TROUBLE DIAGNOSIS FOR DTC

1. Check the DTC indicated in the self-diagnosis results.
2. Perform the relevant diagnosis referring to the DTC Index. Refer to SN-16, "DTC Index".

>> GO TO 5.

4. TROUBLE DIAGNOSIS FOR SYMPTOMS

Perform the relevant diagnosis referring to the diagnosis chart by symptom. Refer to SN-39, "Symptom Table".

>> GO TO 5.

5. ERROR PART REPAIR

1. Repair or replace the identified malfunctioning parts.
2. Perform Self Diagnostic Result for SONAR with CONSULT.

NOTE:
Erase the stored self-diagnosis results after repairing or replacing the relevant components if any DTC has been indicated in the self-diagnosis results.

3. Check that the symptom does not occur.

Does the symptom occur?

YES >> GO TO 1.
NO >> Inspection End.

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT : Description

INFOID:0000000011978506

BEFORE REPLACEMENT

When replacing sonar control unit, save or print current vehicle specification with CONSULT configuration before replacement.

NOTE:

If “Before Replace ECU” cannot be used, use the “After Replace ECU” or “Manual Configuration” after replacing sonar control unit.

AFTER REPLACEMENT

CAUTION:

When replacing sonar control unit, you must perform “After Replace ECU” with CONSULT.

- **Complete the procedure of “After Replace ECU” in order.**
- **If you set incorrect “After Replace ECU”, incidents might occur.**
- **Configuration is different for each vehicle model. Confirm configuration of each vehicle model.**

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT : Work Procedure

INFOID:0000000011978507

1.SAVING VEHICLE SPECIFICATION

CONSULT

Enter “Re/Programming, Configuration” and perform “Before Replace ECU” to save or print current vehicle specification.

NOTE:

If “Before Replace ECU” cannot be used, use the “After Replace ECU” or “Manual Configuration” after replacing sonar control unit.

>> GO TO 2.

2.REPLACE SONAR CONTROL UNIT

Replace sonar control unit. Refer to SN-41, "Removal and Installation".

>> GO TO 3.

3.WRITING VEHICLE SPECIFICATION

CONSULT

1. Enter "Re/Programming, Configuration".
2. If “Before Replace ECU” operation was performed, an "Operation Log Selection" screen will automatically be displayed. Select the applicable file from the "Saved Data List" and press “Confirm” to write vehicle specification. Refer to SN-25, "CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure".
3. If “Before Replace ECU” operation was not performed, select "After Replace ECU" or "Manual Configuration" to write vehicle specification. Refer to SN-25, "CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure".

>> GO TO 4.

4.OPERATION CHECK

Check that the operation of the sonar control unit is normal.

>> Work End.

CONFIGURATION (SONAR CONTROL UNIT)

CONFIGURATION (SONAR CONTROL UNIT) : Description

INFOID:0000000011978508

Vehicle specification needs to be written with CONSULT. Configuration has three functions as follows:

Function	Description
"Before Replace ECU"	• Reads the vehicle configuration of current sonar control unit. • Saves the read vehicle configuration.
"After Replace ECU"	Writes the vehicle configuration with manual selection.
"Select Saved Data List"	Writes the vehicle configuration with saved data.

CAUTION:

- **When replacing sonar control unit, you must perform “Select Saved Data List” or "After Replace ECU" with CONSULT.**
- **Complete the procedure of “Select Saved Data List” or "After Replace ECU" in order.**
- **If you set incorrect “Select Saved Data List” or "After Replace ECU", incidents might occur.**
- **Configuration is different for each vehicle model. Confirm configuration of each vehicle model.**
- **Never perform “Select Saved Data List” or "After Replace ECU" except for new sonar control unit.**

CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure

INFOID:0000000011978509

1.WRITING MODE SELECTION

CONSULT

Select “Reprogramming, Configuration” of sonar control unit.

When writing saved data>>GO TO 2.
When writing manually>>GO TO 3.

2.PERFORM “SAVED DATA LIST”

CONSULT

Automatically “Operation Log Selection” window will display if “Before Replace ECU” was performed. Select applicable file from the “Save Data List” and press “Confirm”.

>> Work End.

3.PERFORM “AFTER REPLACE ECU” OR “MANUAL CONFIGURATION”

CONSULT

1. Select “After Replace ECU” or “Manual Configuration”.
2. Identify the correct model and configuration list. Refer to SN-26, "CONFIGURATION (SONAR CONTROL UNIT) : Configuration List".
3. Confirm and/or change setting value for each item.
   CAUTION:
   Thoroughly read and understand the vehicle specification. ECU control may not operate normally if the setting is not correct.
4. Select “Next”.
   CAUTION:
   Make sure to select “Next”, confirm each setting value and press “OK” even if the indicated configuration of brand new sonar control unit is same as the desirable configuration. If not, configuration which is set automatically by selecting vehicle model can not be memorized.
5. When "Completed", select "End".

>> GO TO 4.

4.OPERATION CHECK

Confirm that each function controlled by sonar control unit operates normally.

>> Work End.

CONFIGURATION (SONAR CONTROL UNIT) : Configuration List

INFOID:0000000011978510

CAUTION:

Thoroughly read and understand the vehicle specification. Incorrect settings may result in abnormal control of ECU.

MANUAL SETTING ITEM	
Items	Setting value
BCI FUNCTION	WITH ⇔ WITHOUT*

⇔: Items which confirm vehicle specifications

*: BCI FUNCTION should always be set to WITHOUT.

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000012248781

DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real-time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independently). In CAN communication, control units are connected with 2 communication lines (CAN high, CAN low) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
CAN Communication Signal Chart. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
U1000	CAN COMM CIRCUIT (CAN COMM CIRCUIT)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	–
		Threshold	–
		Diagnosis delay time	2 seconds or more

POSSIBLE CAUSE

CAN communication system

FAIL-SAFE

The system using the CAN communication signal from control unit which cannot communicate does not function.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT
1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 30 seconds.
3. Turn ignition switch ON and wait at least 30 seconds or more.
4. Select “Self Diagnostic Result” mode of “SONAR”.
5. Check DTC.

Is DTC U1000 detected?

YES >> Proceed to SN-27, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012248782

1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

CONSULT
1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure again. Refer to SN-27, "DTC Description".

Is DTC detected again?

YES >> Perform the trouble diagnosis for CAN communication system. Refer to LAN-17, "Trouble Diagnosis Flow Chart".
NO >> Inspection End.

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:0000000012248783

DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real-time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independently). In CAN communication, control units are connected with 2 communication lines (CAN high, CAN low) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
CAN Communication Signal Chart. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
U1010	CONTROL UNIT (CAN) [Control unit (CAN)]	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	-
		Threshold	-
		Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

CAN communication system

FAIL-SAFE

The system using the CAN communication signal does not function.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

1. Turn ignition switch OFF and wait at least 30 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 30 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT
1. Turn ignition switch ON and wait at least 30 seconds or more.
2. Select “Self Diagnostic Result” mode of “SONAR”.
3. Check DTC.

Is DTC U1010 detected?

YES >> Proceed to SN-28, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-41, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000012248784

1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

CONSULT
1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure again. Refer to SN-28, "DTC Description".

Is DTC U1010 detected again?

YES >> Replace sonar control unit. Refer to SN-41, "Removal and Installation".
NO >> Inspection End.

B2720 CORNER SENSOR [RL]

DTC Logic

INFOID:0000000011978514

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2720	REAR LEFT SIDE EXTERNAL SENSOR (Rear sonar sensor LH outer)	1	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Rear sonar sensor LH outer circuit is shorted to ground (terminal 22 (without driver assistance system, or 8 (with driver assistance system))
			Threshold	Rear sonar sensor LH outer circuit is shorted to ground
			Diagnosis delay time	30 seconds or more
		2	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Rear sonar sensor LH outer signal is open (terminal 22 (without driver assistance system, or 8 (with driver assistance system))
			Threshold	Rear sonar sensor LH outer circuit is open
			Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

- Sensor configuration
- Harness or connectors
- Rear sonar sensor LH outer

FAIL-SAFE

Rear sonar sensor LH outer signal is not received

Diagnosis Procedure

INFOID:0000000011978515

Regarding Wiring Diagram information, refer to SN-17, "Wiring Diagram".

1.CHECK REAR SONAR SENSOR LH CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and rear sonar sensor LH connector T3.
3. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and rear sonar sensor LH connector T3.

Without driver assistance system

Sonar control unit		Rear sonar sensor LH		Continuity
Connector	Terminal	Connector	Terminal	
M122	22	T3	2	Yes
	14		1	

With driver assistance system

Sonar control unit		Rear sonar sensor LH		Continuity
Connector	Terminal	Connector	Terminal	

M351	8	T3	2	Yes
	1		1	

4. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M122	22	—	No

With driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M351	8	—	No

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connectors.

2.CHECK REAR SONAR SENSOR LH SIGNAL CIRCUIT SHORT TO BATTERY

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M122	22	—	0V

With driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M351	8	—	0V

Is the inspection result normal?

YES >> Replace rear sonar sensor LH. Refer to SN-40, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B2723 CORNER SENSOR [RR]

DTC Logic

INFOID:0000000011978516

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2723	REAR RIGHT SIDE EXTERNAL SENSOR (Rear sonar sensor RH outer)	1	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Rear sonar sensor RH outer circuit is shorted to ground (terminal 10 (without driver assistance system), or 7 (with driver assistance system))
			Threshold	Rear sonar sensor RH outer circuit is shorted to ground
			Diagnosis delay time	30 seconds or more
		2	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Rear sonar sensor RH outer signal is open (terminal 10 (without driver assistance system), or 7 (with driver assistance system))
			Threshold	Rear sonar sensor RH outer circuit is open
			Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

- Sensor configuration
- Harness or connectors
- Rear sonar sensor RH outer

FAIL-SAFE

Rear sonar sensor RH outer signal is not received

Diagnosis Procedure

INFOID:0000000011978517

Regarding Wiring Diagram information, refer to SN-17, "Wiring Diagram".

1.CHECK REAR SONAR SENSOR RH SIGNAL CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and rear sonar sensor RH connector T4.
3. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and rear sonar sensor RH connector T4.

Without driver assistance system

Sonar control unit		Rear sonar sensor RH		Continuity
Connector	Terminal	Connector	Terminal	
M122	10	T4	2	Yes
	14		1	

With driver assistance system

Sonar control unit		Rear sonar sensor RH		Continuity
Connector	Terminal	Connector	Terminal	

M351	7	T4	2	Yes
	1		1	

4. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M122	10	—	No

With driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M351	7	—	No

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connectors.

2.CHECK REAR SONAR SENSOR RH SIGNAL CIRCUIT SHORT TO BATTERY

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M122	10	—	0V

With driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M351	7	—	0V

Is the inspection result normal?

YES >> Replace rear sonar sensor RH. Refer to SN-40, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B2724 SONAR CONTROL UNIT

DTC Description

INFOID:0000000012248785

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
B2724	SONAR CONTROL UNIT (Sonar control unit)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	–
		Threshold	–
		Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

Sonar control unit

FAIL-SAFE

Sonar system not functioning

Diagnosis Procedure

INFOID:0000000012248786

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 30 seconds.
3. Turn ignition switch ON and wait at least 30 seconds or more.
4. Select "Self Diagnostic Result" mode of "SONAR".
5. Check DTC.

Is DTC B2724 detected?

YES >> Replace sonar control unit. Refer to SN-41, "Removal and Installation".
NO >> Inspection End.

B2729 CORNER SENSOR [FL]

DTC Logic

INFOID:0000000011978521

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2729	FRONT LEFT SIDE EXTERNAL SENSOR (Front sonar sensor LH outer)	1	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Front sonar sensor LH outer circuit is shorted to ground (terminal 3 (without driver assistance system), or 10 (with driver assistance system))
			Threshold	Front sonar sensor LH outer circuit is shorted to ground
			Diagnosis delay time	30 seconds or more
		2	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Front sonar sensor LH outer signal is open (terminal 3 (without driver assistance system), or 10 (with driver assistance system))
			Threshold	Front sonar sensor LH outer circuit is open
			Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

- Sensor configuration
- Harness or connectors
- Front sonar sensor LH outer

FAIL-SAFE

Front sonar sensor LH outer signal is not received

Diagnosis Procedure

INFOID:0000000011978522

Regarding Wiring Diagram information, refer to SN-17, "Wiring Diagram".

1.CHECK FRONT SONAR SENSOR LH CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and front sonar sensor LH connector E304.
3. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and front sonar sensor LH connector E304.

Without driver assistance system

Sonar control unit		Front sonar sensor LH		Continuity
Connector	Terminal	Connector	Terminal	
M122	3	E304	2	Yes
	13		1	

With driver assistance system

Sonar control unit		Front sonar sensor LH		Continuity
Connector	Terminal	Connector	Terminal	

M351	10	E304	2	Yes
	1		1	

4. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M122	3	—	No

With driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M351	10	—	No

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connectors.

2.CHECK FRONT SONAR SENSOR LH SIGNAL CIRCUIT SHORT TO BATTERY

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M122	3	—	0V

With driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M351	10	—	0V

Is the inspection result normal?

YES >> Replace front sonar sensor LH. Refer to SN-40, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B272C CORNER SENSOR [FR]

DTC Logic

INFOID:0000000011978523

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2720	FRONT RIGHT SIDE EXTERNAL SENSOR (Front sonar sensor RH outer)	1	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Front sonar sensor RH outer circuit is shorted to ground (terminal 4 (without driver assistance system), or 9 (with driver assistance system))
			Threshold	Front sonar sensor RH outer circuit is shorted to ground
			Diagnosis delay time	30 seconds or more
		2	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Front sonar sensor RH outer signal is open (terminal 4 (without driver assistance system), or 9 (with driver assistance system))
			Threshold	Front sonar sensor RH outer circuit is open
			Diagnosis delay time	30 seconds or more

POSSIBLE CAUSE

- Sensor configuration
- Harness or connectors
- Front sonar sensor RH outer

FAIL-SAFE

Front sonar sensor RH outer signal is not received

Diagnosis Procedure

INFOID:0000000011978524

Regarding Wiring Diagram information, refer to SN-17, "Wiring Diagram".

1.CHECK FRONT SONAR SENSOR RH CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and front sonar sensor RH connector E302.
3. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and front sonar sensor RH connector E302.

Without driver assistance system

Sonar control unit		Front sonar sensor RH		Continuity
Connector	Terminal	Connector	Terminal	
M122	4	E302	2	Yes
	13		1	

With driver assistance system

Sonar control unit		Front sonar sensor RH		Continuity
Connector	Terminal	Connector	Terminal	

M351	9	E302	2	Yes
	1		1	

4. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M122	4	—	No

With driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M351	9	—	No

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connectors.

2.CHECK FRONT SONAR SENSOR RH SIGNAL CIRCUIT SHORT TO BATTERY

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M122	4	—	0V

With driver assistance system

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M351	9	—	0V

Is the inspection result normal?

YES >> Replace front sonar sensor RH. Refer to SN-40, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000011978527

Regarding Wiring Diagram information, refer to SN-17, "Wiring Diagram".

1.CHECK FUSE

Check that the following fuse is not blown:

Terminal No.	Signal name	Fuse No.
12 (without driver assistance system)	IGN power supply	30 (10A)
24 (with driver assistance system)		

Is the fuse blown?

YES >> Replace the blown fuse after repairing the affected circuit.
NO >> GO TO 2.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system).
3. Check voltage between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
M122	12	—	Ignition switch: ON	Battery voltage

With driver assistance system

Sonar control unit		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
M351	24	—	Ignition switch: ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connectors.

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M122 (without driver assistance system), or M351 (with driver assistance system), and ground.

Without driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M122	15	—	Yes

With driver assistance system

Sonar control unit		Ground	Continuity
Connector	Terminal		
M351	13	—	Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair or replace harness or connectors.

SYMPTOM DIAGNOSIS

SONAR SYSTEM

Symptom Table

INFOID:0000000011978528

Symptom	Possible cause	Reference page
Malfunction is detected in only 1 sensor of display (Always displayed in red).	• Sonar sensor circuit • Sonar sensor	• SN-34 (front LH) SN-36 (front RH) SN-29 (rear LH) SN-31 (rear RH) • SN-40 (removal and installation)
Malfunction is detected in all 4 sensors of display (Always displayed in red).	• Sonar control unit power supply and ground circuits • CAN communication circuits	• SN-38 • LAN-17, "Trouble Diagnosis Flow Chart"

REMOVAL AND INSTALLATION

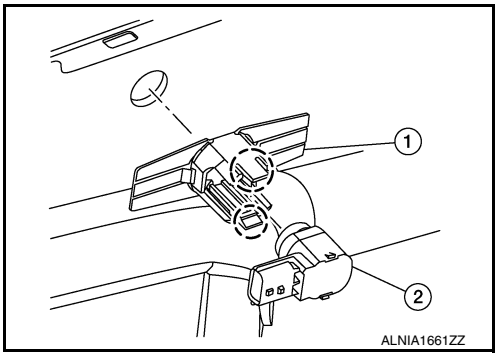
SONAR SENSOR

Removal and Installation - Front Sonar Sensors

INFOID:0000000011978529

REMOVAL

1. Remove front bumper fascia. Refer to EXT-17, "Removal and Installation".
2. Disconnect harness connector from front sonar sensor.
3. Release front sonar sensor finisher (1) pawls using suitable tool and remove front sonar sensor (2) from front sonar sensor finisher.
   ◌: Pawl
4. Remove front sonar sensor finisher (1) from front bumper fascia (if necessary).



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

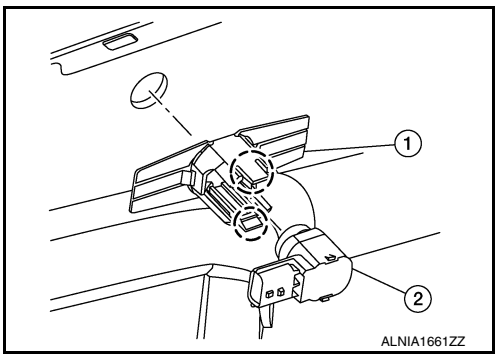
If front sonar sensor finisher is replaced, clean area before installation.

Removal and Installation - Rear Sonar Sensors

INFOID:0000000011978530

REMOVAL

1. Disconnect harness connector from rear sonar sensor.
2. Release rear sonar sensor finisher (1) pawls using suitable tool and remove rear sonar sensor (2) from rear sonar sensor finisher.
   ◌: Pawl
3. Remove rear sonar sensor finisher (1) from rear bumper fascia (if necessary).



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

If rear sonar sensor finisher is replaced, clean area before installation.

SONAR CONTROL UNIT

Removal and Installation

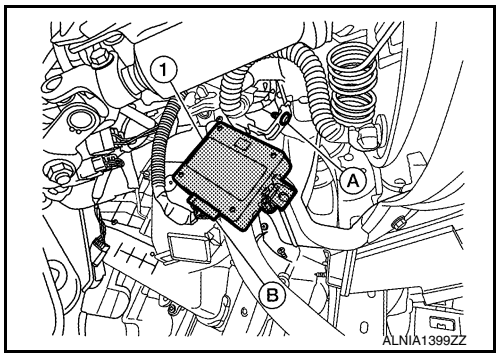
INFOID:0000000011978531

REMOVAL

CAUTION:

Before replacing the sonar control unit, perform "READ CONFIGURATION" to save or print current vehicle specification. Refer to SN-24, "ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT : Description".

1. Remove the instrument lower panel LH. Refer to IP-23, "Removal and Installation".
2. Disconnect the harness connector (B) from the sonar control unit (1).
3. Remove the screw (A) from the sonar control unit (1) and remove.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to perform "WRITE CONFIGURATION" when replacing sonar control unit. Refer to SN-24, "ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT : Description".

BUZZER

Removal and Installation

INFOID:0000000011978532

NOTE:
Sonar Buzzer function is integrated with the AV control unit, for removal and installation Refer to AV-183, "Removal and Installation".